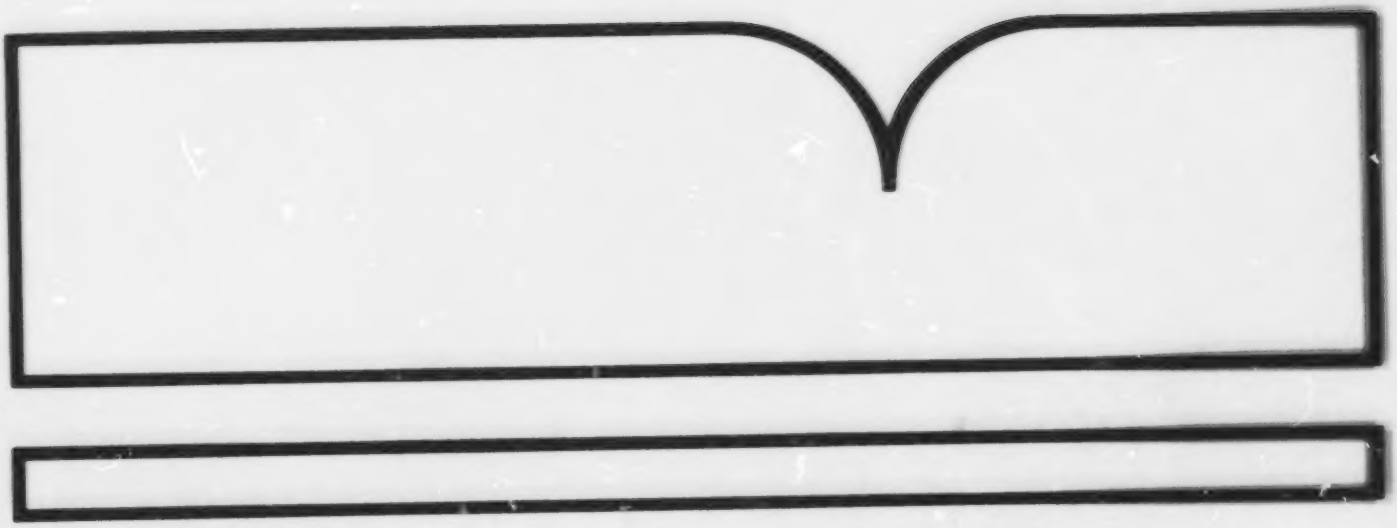
PB86-141959

Environmental Radiation Data
Report 41, January-March 1985

(U.S.) Eastern Environmental Radiation Facility,
Montgomery, AL

Jun 85



U.S. Department of Commerce
National Technical Information Service
NTIS

United States
Environmental Protection
Agency

Eastern Environmental
Radiation Facility
1890 Federal Drive
Montgomery, AL 36109

EPA 520/5-85-030
June 1985

PB86-141959

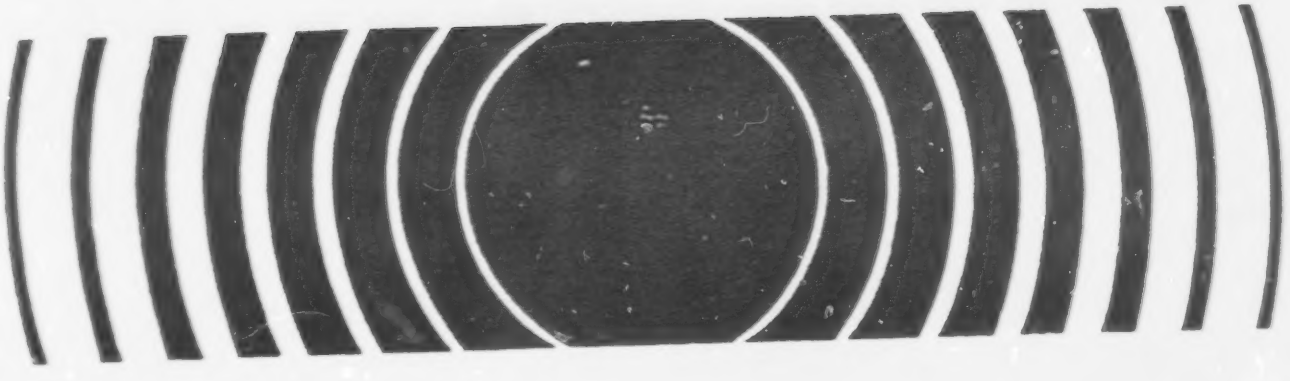
Radiation

EPA

Environmental Radiation Data

Report 41

January - March 1985



REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA 520/5-85-030		PB86 141959/AS

4. TITLE AND SUBTITLE	5. REPORT DATE
Environmental Radiation Data Report 41	June 1985
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) U.S. EPA (Charles M. Petko/EERF) (Charles R. Phillips/EERF)	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Environmental Protection 401 M Street, S.W. Washington, D.C. 20460	10. PROGRAM ELEMENT NO.
	11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS U.S. Environmental Protection Agency 401 M Street, S.W. Washington, D.C. 20460	13. TYPE OF REPORT AND PERIOD COVERED
	14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

Environmental Radiation Data (ERD) is compiled and distributed quarterly by the Office of Radiation Programs and contains data from the Environmental Radiation Ambient Monitoring System (ERAMS). Data from similar networks operated by contributing States, Canada, Mexico, and the Pan American Health Organization are reported in the ERD when available.

The ERAMS is comprised of nationwide sampling stations that provide air, surface and drinking water, and milk samples from which environmental radiation levels are derived.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
unlimited	unclassified	
	20. SECURITY CLASS *(This page)* unclassified	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

E N V I R O N M E N T A L

R A D I A T I O N

D A T A

REPORT 41

January - March 1985

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Office of Radiation Programs

Preface

Environmental Radiation Data (ERD) is compiled and distributed quarterly by the Office of Radiation Programs' Eastern Environmental Radiation Facility (EERF), Montgomery, Alabama, and contains data from the Environmental Radiation Ambient Monitoring System (ERAMS). Data from similar networks operated by contributing States, Canada, Mexico, and the Pan American Health Organization are reported in the ERD when available.

ERAMS was established in 1973 by the U. S. Environmental Protection Agency's Office of Radiation Programs (ORP). The ERAMS is comprised of nationwide sampling stations that provide air, surface and drinking water, and milk samples from which environmental radiation levels are derived. The major emphasis for ERAMS is toward identifying trends in the accumulation of long-lived radionuclides in the environment.

Sampling locations are selected to provide optimal population coverage while functioning to monitor fallout from nuclear devices and other forms of radioactive contamination of the enviromnent. The radiation analyses performed on these samples include gross alpha and gross beta levels, gamma analyses for fission products, and specific analyses for uranium, plutonium, strontium, iodine, radium, krypton, and tritium. This monitoring effort also provides ancillary information on natural background levels and on releases into the environment from stationary sources such as nuclear power reactors, fuel fabrication facilities, and reprocessing plants.

The radiochemical procedures used by the EERF in processing the ERAMS samples are contained in Eastern Environmental Radiation Facility Radiochemistry Procedures Manual.

ENVIRONMENTAL RADIATION DATA

CONTENTS

	Page
DATA - Reporting Rationale and Procedures	vii
- Table of Reporting Increments and Minimum Detectable Levels	ix
DATA - ERAMS	
SECTION I. Air Program	1
1. Airborne Particulates and Precipitation	1
2. Plutonium and Uranium in Airborne Particulates and Precipitation	13
3. Krypton-85	17
SECTION II. Water Program	18
1. Surface Water	18
2. Drinking Water	21
SECTION III. External Gamma Ambient Monitoring Program	24

Preceding page blank

SECTION IV. Milk Program 26

1. Pasteurized Milk 26

2. Strontium-89 and -90 in Milk 26

3. Carbon-14 in Milk 34

DATA - Reporting Rationale and Procedures

In 1973, the U.S. Environmental Protection Agency's Office of Radiation Programs, established the Environmental Radiation Monitoring System(ERAMS) to provide continuous, accurate, and usable environmental radiation data to the public. For completeness, ERAMS data for all specific radionuclide analyses are reported as the counting results indicate, whether the numbers are negative, zero, or positive.

Reporting Rationale

Frequently, concentrations of a radionuclide in environmental media are close to zero. When the actual concentration of a nuclide is zero, the net counting results should statistically show a distribution of negative and positive numbers about zero. This occurs when the background count is subtracted from a sample which has only background activity. Prior to July 1975, ERAMS data were not reported numerically when the results were less than a specified reporting level or minimum detectable level. The present reporting procedure allows all the data to be reported and evaluated statistically without an arbitrary cutoff of small or negative numbers. This approach will facilitate estimates of bias in the nuclide analyses and will allow better evaluation of distributions and trends in environmental data.

When reviewing the data in this report, caution should be exercised in the interpretation of individual negative values. Obviously, a negative activity value has no physical significance. Such numbers, however, are significant when taken together with other observations which indicate that the true value of a distribution is near zero. When an average of many measurements produces a result less than zero, this indicates a negative bias in the measurement procedure.

(1) Reported Values

Specific Analyses - All specific radionuclide analyses will be reported as the counting results indicate, whether the number is negative, zero, or positive. All reported values are corrected for decay to the collection date.

Potassium concentrations are determined by specific activity analyses.

Gross Analyses - The actual value of gross radioactivity measurements will be reported, unless the value is below the minimum detectable level (MDL) at the 2 sigma confidence level, then < minimum detectable level will be reported.

MDL is defined as the 3 sigma error of the background. A tabulation of MDL's is given in the following table.

(2) Reported Error Terms

Each reported value for specific analyses will be accompanied by a counting error term at the 2 sigma (95%) confidence interval. Error terms are therefore reported as counting errors. At the very low levels characteristic of most ERAMS measurements, counting error is the greatest contributor to overall error.

(3) Significant Figures

All reported values will be rounded to no more than three significant figures. The last significant figure will be increased by one if the figure following is five or greater, otherwise it is left unchanged.

(4) Reporting Levels

The reporting units, smallest increments for reporting, and minimum detectable levels for each isotope are shown in Table 1. Smallest increments are sometimes considerably smaller than minimum detectable amounts to avoid truncation errors in averaging.

(5) Averages

Averages will be calculated along with appropriate error terms in an annual summary and analysis of ERAMS data. In calculating these averages, all values of individual data including negative numbers will be utilized. Averages will not be included in ERD quarterly reports.

TABLE 1

ERAMS Reporting Increments and Minimum Detectable Levels

for Radionuclide Analyses

Radionuclide	Media	Reporting Units	Reporting Increments	Minimum Detectable Levels
Gross alpha	Water	pCi/l	1 pCi/l	2 pCi/l
Gross beta	Air	pCi/m^3	.01 pCi/m^3	.01 pCi/m^3
	Water	pCi/l	1 pCi/l	1 pCi/l
	Precipitation	nCi/m^2	.01 nCi/m^2	.01 nCi/m2(a)
Tritium	Water	nCi/l	.1 nCi/l	.2 nCi/l
	Milk	nCi/l	.1 nCi/l	.2 nCi/l
Carbon-14	Milk	pCi/l	1 pCi/l	15 pCi/l
Krypton-85	Ambient Air	pCi/m^3	.1 pCi/m^3	2 pCi/m^3
Plutonium-238, 239	Air	aCi/m^3	.1 aCi/m^3	.015 pCi(b) per sample
	Milk	pCi/l	.001 pCi/l	.015 pCi per sample
	Water	pCi/l	.001 pCi/l	.015 pCi per sample
Uranium-234, 235,238	Air	aCi/m^3	.1 aCi/m^3	.015 pCi(b) per sample
	Milk	pCi/l	.001 pCi/l	.015 pCi per sample
	Water	pCi/l	.001 pCi/l	.015 pCi per sample
Radium-226	Water	pCi/l	.1 pCi/l	.1 pCi/l

Radionuclide	Media	Reporting Units	Reporting Increments	Minimum Detectable Levels
Strontium-90	Milk	pCi/l	.1 pCi/l	1 pCi/l
	Water	pCi/l	.1 pCi/l	1 pCi/l
Strontium-89	Milk	pCi/l	1 pCi/l	5 pCi/l(c)
Iodine-131	Milk	pCi/l	1 pCi/l	10 pCi/l(c)
	Water	pCi/l	1 pCi/l	10 pCi/l(c)
	Water (specific radiochemical analysis)	pCi/l	.1 pCi/l	.4 pCi/l
Iodine-129	Milk	fCi/l	.1 fCi/l	.4 fCi/l
Cesium-137	Milk	pCi/l	1 pCi/l	10 pCi/l
	Water	pCi/l	1 pCi/l	10 pCi/l
Barium-140	Milk	pCi/l	1 pCi/l	10 pCi/l(c)
	Water	pCi/l	1 pCi/l	10 pCi/l(c)
Potassium	Milk	g/l	.1 g/l	.12 g/l
	Water	g/l	.1 g/l	.12 g/l
Potassium-40	Water	pCi/l	1 pCi/l	100 pCi/l

(a) The value in terms of nCi/m^2 would be dependent on precipitation (mm).
(b) This value in terms of pCi/m^3 would be dependent on the air volume.
(c) Activity as of the day of counting.

ENVIRONMENTAL RADIATION AMBIENT MONITORING SYSTEM (ERAMS)

SECTION I. Air Program

Airborne Particulates and Precipitation

Gross beta radioactivity measurements and certain specific analyses are performed on air particulates and precipitation samples as indicator measurements in assessing the general (national) impact of all contributing sources on environmental levels of radiation.

Airborne particulates are collected continuously at field stations representing wide geographic coverage, including present and potential sources of environmental radioactivity. Sampling sites are located throughout the United States.

Filters (10-cm diameter synthetic fiber) from air samplers are changed twice weekly and field measurements are made with a G-M survey meter at 5 hours and 29 hours after collection to allow for radon and thoron daughter product decay. Field estimates are reported to appropriate EPA officials by telephone or mail depending on the activity levels found.

The filters are sent to EERF for more sensitive analyses in a low background beta counter. Gamma scans are performed on all filters showing laboratory gross beta counts greater than 1 pCi/m^3. The laboratory obtained values are usually lower than the field estimates due to the decay of naturally occuring radionuclides between the times of the two measurements.

Precipitation samples are collected at these field stations collecting air filters. These samples are also sent to EERF where they are composited monthly for gamma scans, tritium, and gross beta activity measurements. Plutonium-238, -239, and uranium-234, -235, and -238 analyses are performed on samples which exceed 2 pCi/liter gross alpha.

Tables 2 - 4 present the monthly average gross beta concentrations in airborne particulates for January - March 1985

Tables 5 - 7 present the monthly average gross beta concentration in precipitation January - March 1985.

The tritium in precipitation samples for January - March 1985 at the selected stations are shown in Table 8.

A compilation of individual measurements is available from the EPA, EERF, Montgomery, AL 36109.

TABLE 2

AIRBORNE PARTICULATES
GROSS BETA CONCENTRATION
JANUARY 1985

LOCATION	# SAM	5-HR FIELD ESTIMATE			EERF LAB MEASUREMENT		
		MAX	MIN	AVG	MAX	MIN	AVG
		(pCi/m^3)			(pCi/m^3)		
AL:ASHFORD	5	0.0	0.0	0.0	0.01	0.00	0.01
AL:MONTGOMERY	7	0.6	0.1	0.3	0.01	0.01	0.01
AR:LITTLE ROCK	7	0.1	0.0	0.1	0.02	0.01	0.01
AZ:TEMPE	5	0.9	0.4	0.6	0.02	0.02	0.02
CA:BERKELEY	8	0.1	0.0	0.0	0.02	0.00	0.02
CA:LOS ANGELES	8	0.7	0.1	0.5	0.03	0.01	0.02
CO:DENVER	4	2.0	0.2	0.8	0.02	0.01	0.01
CT:HARTFORD	8	0.2	0.1	0.1	0.01	0.01	0.01
DE:WILMINGTON	8	0.2	0.0	0.1	0.02	0.01	0.01
FL:JACKSONVILLE	8	0.2	0.0	0.1	0.02	0.00	0.01
FL:MIAMI	8	0.1	0.0	0.0	0.02	0.01	0.01
HI:HONOLULU	7	0.2	0.1	0.2	0.01	0.00	0.01
IA:IOWA CITY	8	0.1	0.0	0.1	0.02	0.01	0.01
ID:BOISE	8	0.3	0.1	0.1	0.04	0.00	0.03
ID:IDAHO FALLS	7	0.0	0.0	0.0	0.03	0.00	0.02
IL:CHICAGO	9	0.2	0.0	0.1	0.02	0.01	0.01
IN:INDIANAPOLIS	1	0.2	0.2	0.2	0.01	0.01	0.01
KS:TOPEKA	5	0.1	0.0	0.1	0.02	0.01	0.01
ME:AUGUSTA	8	0.1	0.0	0.1	0.03	0.01	0.01
MI:LANSING	9	0.1	0.0	0.0	0.02	0.01	0.01
MN:MINNEAPOLIS	7	0.2	0.0	0.1	0.02	0.01	0.01
MO:JEFFERSON CITY	8	0.2	0.1	0.1	0.02	0.01	0.01
MS:JACKSON	8	0.3	0.1	0.1	0.02	0.01	0.01
NC:CHARLOTTE	7	0.1	0.0	0.1	0.01	0.00	0.01
NC:WILMINGTON	9	0.2	0.0	0.1	0.01	0.00	0.01
ND:BISMARCK	7	0.0	0.0	0.0	0.02	0.01	0.01
NH:CONCORD	9	0.1	0.0	0.1	0.02	0.00	0.01
NJ:TRENTON	8	0.1	0.0	0.1	0.01	0.00	0.01
NV:LAS VEGAS	8	0.3	0.1	0.2	0.02	0.01	0.01
NY:ALBANY	5	0.1	0.0	0.0	0.02	0.01	0.01
NY:NEW YORK CITY	7	0.1	0.0	0.1	0.02	0.01	0.01
NY:NIAGARA FALLS	8	0.1	0.0	0.1	0.01	0.01	0.01
NY:SYRACUSE	7	0.1	0.0	0.1	0.02	0.00	0.01
NY:YAPHANK	8	0.0	0.0	0.0	0.02	0.01	0.01
OH:COLUMBUS	6	0.1	0.0	0.1	0.02	0.01	0.01
OH:PAINESVILLE	8	0.1	0.0	0.1	0.01	0.01	0.01
OH:TOLEDO	8	0.3	0.0	0.1	0.02	0.00	0.01
OK:OKLAHOMA CITY	5	0.5	0.1	0.3	0.02	0.01	0.01

TABLE 2 (CONTINUED)

AIRBORNE PARTICULATES
GROSS BETA CONCENTRATION
JANUARY 1985

LOCATION	# SAM	5-HR FIELD ESTIMATE			EERF LAB MEASUREMENT		
		MAX	MIN	AVG	MAX	MIN	AVG
		(pCi/m^3)			(pCi/m^3)		
OR:PORTLAND	6	0.0	0.0	0.0	0.02	0.01	0.01
PA:GOLDSBORO	6	0.1	0.0	0.1	0.01	0.01	0.01
PA:HARRISBURG	5	0.1	0.0	0.1	0.01	0.01	0.01
RI:PROVIDENCE	4	0.1	0.0	0.1	0.01	0.01	0.01
SC:BARNWELL	2	0.0	0.0	0.0	0.01	0.00	0.00
SC:COLUMBIA	9	0.2	0.1	0.1	0.03	0.01	0.01
SD:PIERRE	7	0.5	0.0	0.2	0.02	0.01	0.01
TN:KNOXVILLE	6	0.3	0.1	0.2	0.02	0.01	0.01
TN:NASHVILLE	4	0.1	0.1	0.1	0.02	0.01	0.02
TX:AUSTIN	6	0.4	0.1	0.2	0.02	0.01	0.01
TX:EL PASO	6	0.8	0.2	0.5	0.03	0.01	0.02
VA:LYNCHBURG	8	0.3	0.0	0.1	0.01	0.01	0.01
WA:SEATTLE	3	0.0	0.0	0.0	0.01	0.01	0.01
WA:SPOKANE	8	0.1	0.0	0.0	0.03	0.01	0.02
WI:MADISON	9	0.1	0.0	0.1	0.02	0.00	0.01
WV:CHARLESTON	4	0.4	0.1	0.2	0.02	0.01	0.01

MINIMUM DETECTABLE LIMIT FOR FIELD ESTIMATES - .1 pCi/m^3
MINIMUM DETECTABLE LIMIT FOR LAB MEASUREMENT - .01 pCi/m^3

TABLE 3

AIRBORNE PARTICULATES
GROSS BETA CONCENTRATION
FEBRUARY 1985

LOCATION	# SAM	5-HR FIELD ESTIMATE			EERF LAB MEASUREMENT		
		MAX	MIN	AVG	MAX	MIN	AVG
		(pCi/m^3)			(pCi/m^3)		
AL:MONTGOMERY	8	0.6	0.0	0.3	0.02	0.00	0.01
AR:LITTLE ROCK	7	0.1	0.0	0.1	0.02	0.01	0.01
AZ:TEMPE	7	2.0	0.0	1.0	0.02	0.01	0.02
CA:BERKELEY	8	0.0	0.0	0.0	0.01	0.00	0.01
CA:LOS ANGELES	8	1.3	0.2	0.6	0.02	0.00	0.01
CO:DENVER	8	4.7	0.1	0.9	0.02	0.01	0.01
CT:HARTFORD	8	0.2	0.1	0.1	0.01	0.01	0.01
DE:WILMINGTON	6	0.2	0.0	0.1	0.02	0.00	0.01
FL:JACKSONVILLE	8	0.1	0.0	0.1	0.02	0.01	0.01
FL:MIAMI	8	0.0	0.0	0.0	0.01	0.00	0.01
HI:HONOLULU	8	0.2	0.0	0.1	0.01	0.00	0.00
IA:IOWA CITY	8	0.1	0.1	0.1	0.02	0.01	0.01
ID:BOISE	7	0.1	0.0	0.1	0.03	0.00	0.02
ID:IDAHO FALLS	7	0.0	0.0	0.0	0.04	0.00	0.02
IL:CHICAGO	8	0.1	0.0	0.1	0.02	0.01	0.01
IN:INDIANAPOLIS	3	0.5	0.1	0.3	0.02	0.01	0.01
KS:TOPEKA	6	0.2	0.0	0.1	0.01	0.00	0.01
ME:AUGUSTA	8	0.2	0.0	0.1	0.02	0.01	0.01
MI:LANSING	8	0.1	0.0	0.0	0.02	0.01	0.01
MN:MINNEAPOLIS	8	0.2	0.0	0.1	0.02	0.01	0.02
MO:JEFFERSON CITY	8	0.2	0.1	0.1	0.03	0.01	0.02
MS:JACKSON	8	0.1	0.0	0.1	0.02	0.01	0.01
NC:CHARLOTTE	8	0.1	0.0	0.0	0.02	0.00	0.01
NC:WILMINGTON	8	0.2	0.0	0.1	0.05	0.01	0.02
ND:BISMARCK	8	0.1	0.0	0.1	0.03	0.01	0.02
NH:CONCORD	8	0.1	0.0	0.1	0.01	0.01	0.01
NJ:TRENTON	7	0.2	0.0	0.0	0.02	0.01	0.01
NV:LAS VEGAS	8	0.4	0.1	0.2	0.03	0.01	0.02
NY:ALBANY	4	0.1	0.0	0.1	0.02	0.01	0.01
NY:NEW YORK CITY	8	0.0	0.0	0.0	0.02	0.01	0.01
NY:NIAGARA FALLS	8	0.1	0.0	0.0	0.01	0.01	0.01
NY:SYRACUSE	5	0.1	0.0	0.1	0.01	0.01	0.01
NY:YAPHANK	7	0.0	0.0	0.0	0.01	0.00	0.01
OH:COLUMBUS	9	0.1	0.0	0.0	0.02	0.01	0.01
OH:PAINESVILLE	8	0.1	0.0	0.0	0.02	0.01	0.01
OH:TOLEDO	8	0.2	0.0	0.1	0.02	0.01	0.02
OK:OKLAHOMA CITY	8	0.5	0.1	0.3	0.03	0.01	0.01
OR:PORTLAND	8	0.0	0.0	0.0	0.02	0.00	0.01

TABLE 3 (CONTINUED)

AIRBORNE PARTICULATES
GROSS BETA CONCENTRATION
FEBRUARY 1985

LOCATION	# SAM	5-HR FIELD ESTIMATE			EERF LAB MEASUREMENT		
		MAX	MIN	AVG	MAX	MIN	AVG
		(pCi/m^3)			(pCi/m^3)		
PA:GOLDSBORO	8	0.1	0.0	0.1	0.02	0.00	0.01
PA:HARRISBURG	4	0.1	0.0	0.0	0.02	0.01	0.01
RI:PROVIDENCE	5	0.2	0.0	0.1	0.02	0.01	0.01
SC:BARNWELL	2	0.0	0.0	0.0	0.01	0.00	0.00
SC:COLUMBIA	8	0.3	0.1	0.2	0.02	0.01	0.01
SD:PIERRE	8	2.7	0.6	1.2	0.03	0.01	0.02
TN:KNOXVILLE	6	1.2	0.1	0.4	0.02	0.00	0.01
TN:NASHVILLE	3	0.5	0.1	0.2	0.03	0.01	0.02
TX:AUSTIN	7	0.6	0.1	0.2	0.01	0.01	0.01
VA:LYNCHBURG	8	0.4	0.1	0.2	0.02	0.01	0.01
VA:VIRGINIA BEACH	2	0.1	0.0	0.1	0.01	0.01	0.01
WA:SPOKANE	8	0.1	0.0	0.1	0.03	0.00	0.01
WI:MADISON	7	0.1	0.0	0.0	0.01	0.01	0.01
WV:CHARLESTON	6	0.2	0.0	0.1	0.02	0.01	0.01

MINIMUM DETECTABLE LIMIT FOR FIELD ESTIMATES - .1 pCi/m^3
MINIMUM DETECTABLE LIMIT FOR LAB MEASUREMENT - .01 pCi/m^3

TABLE 4

AIRBORNE PARTICULATES
GROSS BETA CONCENTRATION
MARCH 1985

LOCATION	# SAM	5-HR FIELD ESTIMATE			EERF LAB MEASUREMENT		
		MAX	MIN	AVG	MAX	MIN	AVG
		(pCi/m^3)			(pCi/m^3)		
AL:ASHFORD	4	0.0	0.0	0.0	0.01	0.01	0.01
AL:MONTGOMERY	9	0.6	0.0	0.4	0.02	0.00	0.01
AR:LITTLE ROCK	8	0.1	0.0	0.1	0.01	0.00	0.01
AZ:TEMPE	9	2.6	1.1	1.6	0.02	0.01	0.02
CA:BERKELEY	9	0.0	0.0	0.0	0.01	0.00	0.01
CA:LOS ANGELES	9	0.5	0.1	0.2	0.01	0.00	0.01
CO:DENVER	8	1.0	0.2	0.6	0.02	0.01	0.02
CT:HARTFORD	8	0.3	0.1	0.2	0.01	0.01	0.01
DE:WILMINGTON	7	0.4	0.0	0.1	0.01	0.00	0.01
FL:JACKSONVILLE	5	0.1	0.0	0.1	0.01	0.01	0.01
FL:MIAMI	9	0.0	0.0	0.0	0.01	0.01	0.01
HI:HONOLULU	8	0.1	0.0	0.0	0.01	0.00	0.01
IA:IOWA CITY	9	0.4	0.0	0.2	0.02	0.01	0.01
ID:BOISE	9	0.4	0.0	0.2	0.03	0.01	0.02
ID:IDAHO FALLS	9	0.0	0.0	0.0	0.03	0.01	0.02
IL:CHICAGO	7	0.2	0.0	0.1	0.01	0.01	0.01
IN:INDIANAPOLIS	9	0.3	0.0	0.2	0.01	0.00	0.01
KS:TOPEKA	8	1.9	0.1	0.4	0.01	0.00	0.00
ME:AUGUSTA	4	0.1	0.1	0.1	0.01	0.01	0.01
MI:LANSING	8	0.2	0.0	0.1	0.01	0.01	0.01
MN:MINNEAPOLIS	8	0.3	0.0	0.1	0.01	0.01	0.01
MO:JEFFERSON CITY	9	0.8	0.1	0.3	0.01	0.01	0.01
MS:JACKSON	8	0.4	0.1	0.2	0.03	0.01	0.01
NC:CHARLOTTE	8	0.1	0.0	0.1	0.01	0.01	0.01
NC:WILMINGTON	8	0.2	0.0	0.1	0.02	0.01	0.01
ND:BISMARCK	9	0.3	0.0	0.1	0.02	0.00	0.01
NH:CONCORD	9	0.1	0.0	0.0	0.01	0.00	0.01
NJ:TRENTON	8	0.2	0.1	0.1	0.01	0.00	0.01
NM:SANTA FE	8	0.3	0.1	0.2	0.01	0.01	0.01
NV:LAS VEGAS	8	0.3	0.0	0.2	0.03	0.01	0.01
NY:ALBANY	3	0.0	0.0	0.0	0.02	0.01	0.01
NY:NEW YORK CITY	9	0.4	0.0	0.1	0.02	0.01	0.01
NY:NIAGARA FALLS	9	0.2	0.0	0.1	0.02	0.01	0.01
NY:SYRACUSE	5	0.0	0.0	0.0	0.01	0.01	0.01
NY:YAPHANK	9	0.0	0.0	0.0	0.01	0.00	0.01
OH:COLUMBUS	8	0.3	0.0	0.1	0.02	0.01	0.01
OH:PAINESVILLE	8	0.1	0.0	0.1	0.01	0.01	0.01
OH:TOLEDO	8	0.5	0.1	0.2	0.03	0.01	0.02

TABLE 4 (CONTINUED)

AIRBORNE PARTICULATES
GROSS BETA CONCENTRATION
MARCH 1985

LOCATION	# SAM	5-HR FIELD ESTIMATE			EERF LAB MEASUREMENT		
		MAX	MIN	AVG	MAX	MIN	AVG
		(pCi/m^3)			(pCi/m^3)		
OK:OKLAHOMA CITY	7	0.5	0.1	0.3	0.01	0.01	0.01
OR:PORTLAND	9	0.0	0.0	0.0	0.01	0.00	0.00
PA:GOLDSBORO	8	0.2	0.1	0.1	0.02	0.01	0.01
PA:HARRISBURG	8	0.5	0.1	0.2	0.01	0.01	0.01
PA:PITTSBURGH	7	0.1	0.1	0.1	0.01	0.01	0.01
RI:PROVIDENCE	6	0.5	0.0	0.1	0.01	0.01	0.01
SC:BARNWELL	2	0.2	0.1	0.2	0.00	0.00	0.00
SC:COLUMBIA	9	0.6	0.1	0.3	0.02	0.01	0.01
SD:PIERRE	8	2.3	0.1	0.8	0.02	0.01	0.01
TN:KNOXVILLE	8	1.9	0.2	0.9	0.02	0.00	0.01
TN:NASHVILLE	4	0.3	0.1	0.2	0.01	0.01	0.01
TX:AUSTIN	9	0.3	0.1	0.2	0.01	0.01	0.01
TX:EL PASO	7	1.4	0.4	0.7	0.04	0.01	0.02
VA:LYNCHBURG	8	0.6	0.1	0.4	0.01	0.00	0.01
VA:VIRGINIA BEACH	2	0.1	0.1	0.1	0.01	0.01	0.01
WA:SEATTLE	2	0.0	0.0	0.0	0.00	0.00	0.00
WA:SPOKANE	8	0.4	0.1	0.2	0.02	0.00	0.01
WI:MADISON	9	0.3	0.1	0.1	0.01	0.00	0.01
WV:CHARLESTON	7	0.4	0.1	0.2	0.01	0.00	0.01

MINIMUM DETECTABLE LIMIT FOR FIELD ESTIMATES - .1 pCi/m^3
MINIMUM DETECTABLE LIMIT FOR LAB MEASUREMENT - .01 pCi/m^3

TABLE 5

GROSS BETA CONCENTRATION IN PRECIPITATION

JANUARY 1985

LOCATION	DEPTH (mm)	ACT. ± 2s (nCi/m^2)		SPECIFIC GAMMA ACT. (pCi/l)
AL:MONTGOMERY	105.0	0.26	0.06	ND
AR:LITTLE ROCK	70.8	0.10	0.04	ND
CA:BERKELEY	7.8	0.03	0.00	ND
CT:HARTFORD	15.0	0.05	0.01	ND
FL:JACKSONVILLE	16.0	0.03	0.01	ND
FL:MIAMI	10.0	0.03	0.01	ND
ID:IDAHO FALLS	20.5	0.02	0.01	ND
IL:CHICAGO	27.0	0.24	0.03	ND
MI:LANSING	56.5	0.05	0.02	ND
MN:MINNEAPOLIS	8.0	0.08	0.01	ND
MS:JACKSON	43.1	0.08	0.02	ND
ND:BISMARCK	14.9	0.05	0.01	ND
NJ:TRENTON	23.0	0.04	0.01	ND
NV:LAS VEGAS	10.0	0.04	0.01	ND
NY:ALBANY	11.5	0.03	0.01	ND
NY:NEW YORK CITY	21.1	0.05	0.01	ND
NY:NIAGARA FALLS	43.7	0.06	0.02	ND
OH:PAINESVILLE	61.3	0.24	0.04	ND
PA:HARRISBURG	86.3	0.19	0.05	ND
SC:BARNWELL	23.8	0.08	0.02	ND
SC:COLUMBIA	71.3	0.09	0.02	ND
TX:AUSTIN	33.3	0.02	0.01	ND
VA:LYNCHBURG	55.0	0.09	0.03	ND
WA:SEATTLE	32.5	0.11	0.02	ND
WI:MADISON	111.5	0.11	0.06	ND

ND NO GAMMA ACTIVITY DETECTABLE
s SIGMA COUNTING ERROR

TABLE 6

GROSS BETA CONCENTRATION IN PRECIPITATION

FEBRUARY 1985

LOCATION	DEPTH (mm)	ACT. ± 2s (nCi/m^2)		SPECIFIC GAMMA ACT. (pCi/l)
AL:MONTGOMERY	137.5	0.31	0.08	ND
AR:LITTLE ROCK	66.3	0.10	0.04	ND
CA:BERKELEY	19.2	0.01	0.01	ND
CO:DENVER	4.5	0.01	0.00	ND
CT:HARTFORD	6.2	0.02	0.00	ND
FL:JACKSONVILLE	34.1	0.03	0.01	ND
FL:MIAMI	6.2	0.02	0.00	ND
ID:BOISE	8.0	0.03	0.01	ND
ID:IDAHO FALLS	5.0	0.16	0.01	ND
IL:CHICAGO	22.4	0.02	0.01	ND
MI:LANSING	167.0	0.11	0.07	ND
MN:MINNEAPOLIS	5.7	0.08	0.01	ND
MS:JACKSON	118.1	0.07	0.05	ND
NJ:TRENTON	17.7	0.05	0.01	ND
NY:NEW YORK CITY	19.7	0.04	0.01	ND
NY:NIAGARA FALLS	78.5	0.13	0.04	ND
OH:PAINESVILLE	71.9	0.31	0.05	ND
OH:TOLEDO	25.0	0.01	0.01	ND
OR:PORTLAND	93.7	0.13	0.05	ND
PA:HARRISBURG	30.8	0.11	0.02	ND
PA:MIDDLETOWN	8.3	0.01	0.00	ND
SC:BARNWELL	36.3	0.09	0.02	ND
SC:COLUMBIA	210.0	0.73	0.13	ND
TN:NASHVILLE	33.3	0.07	0.02	ND
TX:AUSTIN	37.5	0.02	0.02	ND
VA:LYNCHBURG	55.0	0.03	0.02	ND
WA:SEATTLE	2.8	0.00	0.00	ND
WI:MADISON	57.5	0.07	0.03	ND

ND NO GAMMA ACTIVITY DETECTABLE
s SIGMA COUNTING ERROR

TABLE 7

GROSS BETA CONCENTRATION IN PRECIPITATION

MARCH 1985

LOCATION	DEPTH (mm)	ACT. (nCi/m^2)	± 2s	SPECIFIC GAMMA ACT. (pCi/l)
AL:MONTGOMERY	57.5	0.10	0.03	ND
AR:LITTLE ROCK	129.5	0.10	0.07	ND
AZ:PHOENIX	10.0	0.02	0.01	ND
CA:BERKELEY	115.7	0.08	0.05	ND
CO:DENVER	3.5	0.03	0.00	ND
CT:HARTFORD	28.1	0.07	0.02	ND
FL:JACKSONVILLE	39.1	0.12	0.03	ND
FL:MIAMI	42.5	0.04	0.02	ND
ID:BOISE	25.3	0.03	0.01	ND
ID:IDAHO FALLS	24.5	0.01	0.01	ND
IL:CHICAGO	70.8	0.02	0.03	ND
MI:LANSING	157.9	0.18	0.08	ND
MN:MINNEAPOLIS	47.7	0.32	0.04	ND
MS:JACKSON	28.1	0.02	0.01	ND
ND:BISMARCK	36.1	0.04	0.02	ND
NJ:TRENTON	24.1	0.05	0.01	ND
NY:ALBANY	17.8	0.03	0.01	ND
NY:NEW YORK CITY	34.0	0.07	0.02	ND
NY:NIAGARA FALLS	101.7	0.06	0.04	ND
OH:COLUMBUS	18.7	0.01	0.01	ND
OH:PAINESVILLE	131.3	0.31	0.08	ND
OH:TOLEDO	42.5	0.05	0.02	ND
OR:PORTLAND	71.8	0.09	0.04	ND
PA:HARRISBURG	79.5	0.08	0.04	ND
PA:MIDDLETOWN	20.0	0.03	0.01	ND
SC:BARNWELL	23.8	0.07	0.01	ND
SC:COLUMBIA	23.0	0.18	0.02	ND
TN:NASHVILLE	8.0	0.01	0.00	ND
TX:AUSTIN	67.5	0.06	0.03	ND
VA:LYNCHBURG	38.8	0.05	0.02	ND
VA:VIRGINIA BEACH	28.0	0.03	0.01	ND
WA:SEATTLE	35.0	0.01	0.01	ND
WI:MADISON	57.5	0.03	0.03	ND

ND NO GAMMA ACTIVITY DETECTABLE
s SIGMA COUNTING ERROR

TABLE 8

PRECIPITATION
TRITIUM CONCENTRATION

JANUARY - MARCH 1985

LOCATION	JANUARY nCi/l ± 2s	FEBRUARY nCi/l ± 2s	MARCH nCi/l ± 2s
AL:MONTGOMERY	0.1 0.2	0.2 0.2	0.2 0.2
AR:LITTLE ROCK	0.1 0.2	0.1 0.2	0.1 0.2
AZ:PHOENIX	NS	NS	0.1 0.2
CA:BERKELEY	0.2 0.2	0.2 0.2	0.2 0.2
CO:DENVER	NS	0.1 0.2	0.2 0.2
CT:HARTFORD	0.1 0.2	0.1 0.2	0.2 0.2
FL:JACKSONVILLE	0.2 0.2	0.1 0.2	0.2 0.2
FL:MIAMI	0.1 0.2	0.1 0.2	0.2 0.2
ID:BOISE	NS	0.1 0.2	0.2 0.2
ID:IDAHO FALLS	0.1 0.2	0.2 0.2	0.1 0.2
IL:CHICAGO	0.1 0.2	0.2 0.2	0.1 0.2
MI:LANSING	0.2 0.2	0.2 0.2	0.1 0.2
MN:MINNEAPOLIS	0.2 0.2	0.2 0.2	0.3 0.2
MS:JACKSON	0.1 0.2	0.1 0.2	0.2 0.2
ND:BISMARCK	0.2 0.2	NS	0.2 0.2
NJ:TRENTON	0.2 0.2	0.1 0.2	0.2 0.2
NV:LAS VEGAS	0.2 0.2	NS	NS
NY:ALBANY	0.2 0.2	NS	0.2 0.2
NY:NEW YORK CITY	0.1 0.2	0.2 0.2	0.2 0.2
NY:NIAGARA FALLS	0.2 0.2	0.3 0.2	0.2 0.2
OH:COLUMBUS	NS	NS	0.2 0.2
OH:PAINESVILLE	0.2 0.2	0.2 0.2	0.2 0.2
OH:TOLEDO	NS	0.1 0.2	0.2 0.2
OR:PORTLAND	NS	0.1 0.2	0.1 0.2
PA:HARRISBURG	0.2 0.2	0.1 0.2	0.1 0.2
PA:MIDDLETOWN	NS	0.1 0.2	0.2 0.2
SC:BARNWELL	0.7 0.2	2.5 0.2	0.5 0.2
SC:COLUMBIA	0.3 0.2	0.3 0.2	0.3 0.2
TN:NASHVILLE	NS	0.1 0.2	0.2 0.2
TX:AUSTIN	0.1 0.2	0.1 0.2	0.1 0.2
VA:LYNCHBURG	0.2 0.2	0.2 0.2	0.2 0.2
VA:VIRGINIA BEACH	NS	NS	0.2 0.2
WA:SEATTLE	0.2 0.2	0.1 0.2	0.1 0.2
WI:MADISON	0.3 0.2	0.2 0.2	0.1 0.2

NS NO SAMPLE
s SIGMA COUNTING ERROR

Plutonium and Uranium in Airborne Particulates

Environmental radiation levels of plutonium and uranium are determined by the analyses of quarterly composited samples (air filters) collected from the continuously operating airborne particulate samplers.

Concentration of the specific isotopes of plutonium-238, -239, and uranium-234, -235, and -238 are determined by alpha spectroscopy following chemical separation. The volume of air represented by the quarterly composite ranges from 25,000 to 40,000 m^3

Plutonium and uranium in airborne particulates data for January - March 1984 are shown in Table 9.

Table 9.1 contains the results of plutonium and uranium analyses on selected precipitation composite samples for 1984. The composite samples reflected in Table 9.1 are those ERAMS air stations that have the longest history of continuous collection.

TABLE 9

PLUTONIUM AND URANIUM IN AIRBORNE PARTICULATES
JANUARY - MARCH 1984 COMPOSITES

LOCATION	^{238}Pu aCi/m^3	± 2s	^{239}Pu aCi/m^3	± 2s	^{234}U aCi/m^3	± 2s	^{235}U aCi/m^3	± 2s	^{238}U aCi/m^3	± 2s
AL:MONTGOMERY	0.8	0.7	1.1	0.8	9.4	2.0	0.5	0.4	8.8	1.9
CA:BERKELEY	0.1	0.4	0.6	0.5	17.3	3.3	0.4	0.4	18.4	3.4
CA:LOS ANGELES	0.0	0.5	1.6	1.2	40.2	6.9	0.7	0.7	34.1	6.1
CT:HARTFORD	0.1	0.7	0.4	0.5	15.9	2.9	0.4	0.4	13.0	2.5
DE:WILMINGTON	0.2	0.7	0.4	0.5	17.2	3.8	0.2	0.3	11.1	2.9
FL:JACKSONVILLE	-0.3	0.4	0.9	0.7	21.9	4.3	0.1	0.2	26.4	4.8
FL:MIAMI	0.2	0.3	1.1	0.7	18.5	2.9	1.0	0.6	19.2	3.0
GA:ATLANTA	0.2	0.8	0.9	0.7	29.4	5.2	0.2	0.5	24.2	4.6
HI:HONOLULU	-0.1	0.4	0.3	0.3	9.4	2.3	0.2	0.4	4.7	1.5
IA:IOWA CITY	0.3	0.4	0.5	0.4	15.5	2.8	0.8	0.5	17.1	3.0
ID:BOISE	0.0	0.3	0.8	0.5	29.4	5.8	0.9	0.8	25.7	5.2
ID:IDAHO FALLS	0.9	0.9	0.4	0.9	33.8	6.5	1.8	1.2	33.2	6.5
IL:CHICAGO	0.4	0.8	0.9	1.2	48.0	9.2	2.1	1.6	47.5	9.1
KS:TOPEKA	0.1	0.4	0.1	0.2	8.2	2.2	0.1	0.4	6.3	1.9
ME:AUGUSTA	-0.8	1.0	0.6	0.6	44.6	8.2	0.9	1.2	48.3	8.7
MI:LANSING	0.3	0.5	0.7	0.6	25.8	5.2	2.5	1.5	24.5	4.9
MN:MINNEAPOLIS	0.3	0.4	0.5	0.4	18.7	3.2	0.6	0.5	14.2	2.7
MO:JEFFERSON CITY	0.0	0.3	0.2	0.3	19.2	3.3	0.9	0.6	19.9	3.4
MS:JACKSON	0.8	0.8	0.9	0.6	16.6	2.7	0.9	0.5	18.1	2.9
ND:BISMARCK	0.0	0.5	1.0	0.8	56.7	8.6	3.5	1.7	42.5	7.0
NH:CONCORD	0.1	0.3	0.6	0.4	14.2	3.6	0.8	1.0	10.3	3.1
NV:LAS VEGAS	-0.5	0.6	2.3	1.3	46.5	11.0	-0.2	1.7	48.5	11.2
NY:ALBANY	0.2	0.5	0.5	0.4	20.8	3.2	1.0	0.6	23.1	3.4
NY:NEW YORK CITY	-0.7	0.7	0.6	0.6	38.2	8.3	1.3	1.2	16.4	4.8
NY:NIAGARA FALLS	0.4	0.6	1.4	1.0	42.8	7.0	2.4	1.2	37.2	6.3
NY:SYRACUSE	0.5	0.8	0.4	0.5	28.4	5.2	1.9	1.0	25.3	4.8
OH:COLUMBUS	0.1	0.2	0.5	0.4	50.3	6.7	1.1	0.7	46.8	6.4
OH:PAINESVILLE	0.5	0.5	0.7	0.5	35.5	4.5	1.1	0.5	30.5	4.0
OH:TOLEDO	0.3	0.8	0.7	0.8	28.6	4.1	1.0	0.6	29.8	4.3
OR:PORTLAND	0.3	0.5	0.9	0.6	15.3	2.9	0.7	0.6	13.0	2.7
PA:HARRISBURG	-0.1	0.4	0.7	0.6	21.0	3.0	1.0	0.5	15.6	2.5
PA:THREE MILE ISL	0.5	0.6	1.1	0.6	9.4	2.7	0.5	0.6	11.5	3.1
RI:PROVIDENCE	0.1	0.4	0.7	0.4	11.9	2.7	1.4	0.8	13.5	3.0
SC:BARNWELL	0.6	1.1	2.6	1.5	20.0	4.4	1.9	1.2	13.3	3.4
SC:COLUMBIA	-0.3	0.4	0.2	0.3	33.2	5.8	1.4	0.9	34.9	6.0
SD:PIERRE	0.0	0.4	0.8	0.5	26.2	4.1	0.4	0.5	23.5	3.8
TN:KNOXVILLE	0.2	0.4	0.5	0.4	35.0	4.9	1.6	0.7	23.1	3.6
TN:NASHVILLE	0.2	1.2	0.7	0.8	45.7	7.4	4.5	1.9	39.3	6.6
TX:AUSTIN	-0.3	0.7	1.5	1.0	32.5	5.7	1.5	1.0	32.6	5.7
TX:EL PASO	0.4	0.7	0.6	0.6	50.5	7.7	2.0	1.2	47.8	7.4

TABLE 9 (CONTINUED)

PLUTONIUM AND URANIUM IN AIRBORNE PARTICULATES
JANUARY - MARCH 1984 COMPOSITES

LOCATION	^{238}Pu aCi/m^3 ± 2s		^{239}Pu aCi/m^3 ± 2s		^{234}U aCi/m^3 ± 2s		^{235}U aCi/m^3 ± 2s		^{238}U aCi/m^3 ± 2s	
UT:SALT LAKE CITY	0.2	0.4	0.7	0.5	32.0	4.8	1.1	0.7	27.5	4.3
VA:LYNCHBURG	-0.6	0.5	1.1	0.6	1454.0	162.4	22.7	4.0	24.6	4.3
VA:VIRGINIA BEACH	0.0	0.3	0.2	0.6	22.4	4.0	0.6	0.5	17.0	3.3
WA:SEATTLE	0.0	0.3	0.3	0.4	11.0	2.0	0.5	0.4	10.0	1.9
WA:SPOKANE	0.7	0.6	0.6	0.5	26.3	4.9	1.7	1.0	21.2	4.2
WI:MADISON	0.2	0.4	0.5	0.4	14.7	3.2	0.4	0.6	14.4	3.1

s SIGMA COUNTING ERROR

TABLE 9.1

PLUTONIUM AND URANIUM ANALYSES
OF
SELECTED PRECIPITATION COMPOSITE SAMPLES

1984

LOCATION	^{238}Pu pCi/l ± 2s		^{239}Pu pCi/l ± 2s		^{234}U pCi/l ± 2s		^{235}U pCi/l ± 2s		^{238}U pCi/l ± 2s	
AL:MONTGOMERY	-.005	0.012	0.004	0.009	0.008	0.006	0.001	0.002	0.007	0.006
CA:BERKELEY	-.004	0.004	0.005	0.006	0.183	0.045	0.004	0.008	0.073	0.026
CO:DENVER	0.001	0.008	0.003	0.004	0.053	0.022	-0.002	0.003	0.036	0.016
FL:MIAMI	0.007	0.007	0.002	0.006	0.092	0.027	0.002	0.003	0.055	0.021
ID:IDAHO FALLS	-.002	0.007	-0.008	0.008	0.113	0.033	0.008	0.008	0.035	0.017
IL:CHICAGO	-.002	0.006	0.000	0.005	0.069	0.023	0.003	0.005	0.021	0.015
MN:MINNEAPOLIS	-.002	0.008	0.004	0.007	0.129	0.032	0.007	0.009	0.097	0.026
ND:BISMARCK	0.000	0.000	0.004	0.009	0.144	0.034	0.002	0.006	0.067	0.022
NJ:TRENTON	-.004	0.014	-0.002	0.009	0.095	0.035	0.014	0.013	0.056	0.026
NY:NEW YORK CITY	-.005	0.007	-0.037	0.019	NA		NA		NA	
NY:NIAGARA FALLS	-.001	0.006	0.006	0.016	0.017	0.008	0.002	0.002	0.003	0.003
OH:COLUMBUS	-.004	0.006	0.000	0.004	0.136	0.039	0.000	0.005	0.071	0.025
OR:PORTLAND	-.009	0.008	0.000	0.000	0.007	0.007	0.003	0.004	0.008	0.006
PA:HARRISBURG	-.001	0.007	-0.004	0.004	0.054	0.026	0.005	0.007	0.038	0.020
SC:BARNWELL	-.011	0.011	0.006	0.008	0.060	0.021	0.003	0.007	0.021	0.014
SC:COLUMBIA	-.002	0.003	0.002	0.005	0.026	0.014	0.002	0.003	0.019	0.012
TN:KNOXVILLE	-.004	0.006	0.001	0.007	0.134	0.037	0.008	0.010	0.059	0.024
VA:LYNCHBURG	0.000	0.000	0.008	0.008	0.268	0.054	0.007	0.009	0.054	0.023

THE MINIMUM DETECTABLE LIMIT IS .015 pCi/SAMPLE, FOR EACH INDIVIDUAL ISOTOPE.

s SIGMA COUNTING ERROR

Krypton-85

Krypton-85 is a long-lived noble gas with a half life of 10.8 years. It is released into the atmosphere by nuclear reactor operations, fuel reprocessing, weapons tests, and research and defense related activities. Krypton-85 also occurs naturally in minor quantities primarily from the neutron capture of stable krypton-84 as well as spontaneous fission and neutron-induced fission of uranium. Monitoring of krypton-85 in the atmosphere has been conducted to identify and establish baseline levels and long-term trends.

Krypton-85 analysis began in January 1973 with sample collections and analyses being performed for 12 sampling locations. These locations were selected to provide atmospheric coverage of the United States with considerations being given to the proximity to fuel reprocessing plants, nuclear reactors, and wide geographic coverage.

Dry compressed air samples, collected at each location, are purchased from commercial air suppliers annually and shipped to the EERF where the krypton-85 is cryogenically separated and counted in a liquid scintillation system.

The Kr-85 results will be published when they are available.

ERAMS

SECTION II. Water Program

The ERAMS water program provides data on ambient radiation levels in the nation's rivers, streams and drinking water supplies.

Surface Water

Quarterly grab samples are taken downstream from operating or future nuclear facilities at 58 stations.

Surface water samples are analyzed for tritium quarterly and specific gamma activity annually. Tritium is a primary radioactive pollutant from nuclear power plants and weapons production activities.

Tritium concentrations are determined by liquid scintillation counting of distilled samples. Gamma scans are performed annually to determine levels of gamma emitting radionuclides.

Tritium concentrations for surface water samples for January - March 1985 are given in Table 10.

TABLE 10

SURFACE WATER
TRITIUM CONCENTRATION

JANUARY - MARCH 1985

LOCATION	SOURCE	DATE COLLECTED	nCi/l	± 2s
AL:DECATUR	TENNESSEE RIVER	1/ 8/85	0.3	0.2
AL:DOTHAN	CHATTAHOOCHEE R.	1/16/85	0.2	0.2
AL:SCOTTSBORO	TENNESSEE RIVER	1/ 8/85	0.3	0.2
AR:LITTLE ROCK	ARKANSAS RIVER	1/ 2/85	0.2	0.2
CA:DIABLO CANYON	PACIFIC OCEAN	1/24/85	0.1	0.2
CA:EUREKA	HUMBOLDT BAY	1/ 3/85	0.2	0.2
CA:SAN ONOFRE	PACIFIC OCEAN	2/28/85	0.1	0.2
CO:GREELEY	SOUTH PLATTE RIVER	1/ 8/85	0.2	0.2
CT:EAST HADDAM	CONNECTICUT RIVER	1/ 8/85	0.1	0.2
CT:WATERFORD	LONG ISLAND SOUND	1/ 8/85	0.2	0.2
FL:CRYSTAL RIVER	GULF OF MEXICO	1/ 2/85	0.2	0.2
FL:FT. PIERCE	ATLANTIC OCEAN	1/ 2/85	0.2	0.2
FL:HOMESTEAD	BISCAYNE BAY	2/ 6/85	0.1	0.2
IA:CEDAR RAPIDS	CEDAR RIVER	2/12/85	0.2	0.2
ID:BUHL	SNAKE RIVER	1/ 3/85	0.3	0.2
IL:E. MOLINE	MISSISSIPPI RIVER	1/ 2/85	0.2	0.2
IL:MORRIS	ILLINOIS RIVER	1/ 7/85	0.1	0.2
LA:NEW ORLEANS	MISSISSIPPI RIVER	1/17/85	0.1	0.2
MA:ROWE	DEERFIELD RIVER	3/ 6/85	0.2	0.2
MD:CONOWINGO	SUSQUEHANNA RIVER	1/ 2/85	0.3	0.2
MD:LUSBY	CHESAPEAKE BAY	1/ 8/85	0.1	0.2
ME:WISCASSET	MONTSEWAY BAY	1/ 2/85	0.4	0.2
MI:BRIDGMAN	LAKE MICHIGAN	1/ 2/85	0.3	0.2
MI:CHARLEVOIX	LAKE MICHIGAN	1/ 5/85	0.2	0.2
MI:MONROE	LAKE ERIE	1/ 7/85	0.2	0.2
MI:SOUTH HAVEN	LAKE MICHIGAN	1/ 2/85	0.2	0.2
MN:MONTICELLO	MISSISSIPPI RIVER	2/25/85	0.2	0.2
MN:RED WING	MISSISSIPPI RIVER	1/22/85	0.2	0.2
MS:PORT GIBSON	MISSISSIPPI RIVER	1/17/85	0.1	0.2
NC:CHARLOTTE	CATAWBA RIVER	1/ 7/85	0.6	0.2
NC:SOUTHPORT	ATLANTIC OCEAN	1/18/85	0.2	0.2
NE:RULO	MISSOURI RIVER	1/ 8/85	0.2	0.2
NJ:BAYSIDE	DELAWARE RIVER	2/ 7/85	0.2	0.2
NJ:OYSTER CREEK	OYSTER CREEK	2/ 5/85	0.2	0.2
NV:BOULDER CITY	COLORADO RIVER	1/ 8/85	0.1	0.2
NY:OSSINING	HUDSON RIVER	1/ 4/85	0.3	0.2
NY:OSWEGO	LAKE ONTARIO	1/15/85	0.4	0.2
NY:POUGHKEEPSIE	HUDSON RIVER	1/ 3/85	0.3	0.2
OH:TOLEDO	LAKE ERIE	1/ 2/85	0.3	0.2

TABLE 10 (CONTINUED)

SURFACE WATER
TRITIUM CONCENTRATION

JANUARY - MARCH 1985

LOCATION	SOURCE	DATE COLLECTED	nCi/l	± 2s
OR:BRADWOOD	COLUMBIA RIVER	1/17/85	0.1	0.2
PA:DANVILLE	SUSQUEHANNA RIVER	2/20/85	0.1	0.2
PA:PLYMOUTH	SUSQUEHANNA RIVER	1/ 2/85	0.2	0.2
SC:ALLENDALE	SAVANNAH RIVER	1/18/85	6.1	0.3
SC:BROAD RIVER	BROAD RIVER	1/16/85	0.2	0.2
SC:HARTSVILLE	LAKE ROBINSON	1/ 2/85	0.4	0.2
TN:DAISY	TENNESSEE RIVER	2/27/85	0.5	0.2
TN:KINGSTON	CLINCH RIVER	1/14/85	0.3	0.2
TX:EL PASO	RIO GRANDE	1/29/85	0.3	0.2
VA:DOSWELL	NORTH ANNA RIVER	1/10/85	2.1	0.2
WA:NORTHPORT	COLUMBIA RIVER	2/12/85	0.2	0.2
WA:RICHLAND	COLUMBIA RIVER	1/ 8/85	0.2	0.2
WI:TWO CREEKS	LAKE MICHIGAN	1/14/85	0.3	0.2
WI:VICTORY	MISSISSIPPI RIVER	1/14/85	0.2	0.2
WV:WHEELING	OHIO RIVER	1/ 9/85	0.1	0.2

s SIGMA COUNTING ERROR

Drinking Water

This program monitors ambient radiation levels in drinking water at 78 sites. These data serve to assess trends and anomalies in concentrations, and to compare with standards set forth in the EPA "National Interim Primary Drinking Water Regulations." These regulations provide for approval of supplies when the combined radium-226 and radium-228 levels do not exceed 5 pCi/l, when the gross alpha (excluding radon and uranium) levels do not exceed 15 pCi/l, when tritium levels do not exceed 20,000 pCi/l, when the strontium-90 levels do not exceed 8 pCi/l, and when the gross beta levels do not exceed 50 pCi/l.

Grab samples are taken at the 78 sites which are either major population centers or selected nuclear facility environs.

The analyses include (a) tritium on a quarterly basis; (b) gross alpha, gross beta, strontium-90, and gamma on annual composites; (c) radium-226 if the gross alpha exceeds 2 pCi/l and radium-228 if the radium-226 falls between 3 and 5 pCi/l; (d) specific iodine-131 on one quarterly sample per year for each station; and (e) an annual composite for plutonium-238 and -239 and uranium-234, -235, and -238 for stations that demonstrate gross alpha levels greater than 2 pCi/l.

Tritium analyses are performed by scintillation counting of the distilled samples. Gross beta and alpha are determined by evaporating an aliquot on a stainless steel planchet for counting. Radium-226 is determined by the standard emanation technique. Strontium-90 is determined by beta counting a strontium carbonate precipitate isolated by ion exchange.

The results of tritium in drinking water analyses for January - March 1985 are shown in Table 11.

TABLE 11

DRINKING WATER
TRITIUM CONCENTRATION

JANUARY - MARCH 1985

LOCATION	DATE COLLECTED	nCi/l	± 2s
AK:FAIRBANKS	1/14/85	0.2	0.2
AL:DOTHAN	1/16/85	0.1	0.2
AL:MONTGOMERY	1/ 8/85	0.3	0.2
AL:MUSCLE SHOALS	1/ 8/85	0.2	0.2
AL:SCOTTSBORO	1/ 8/85	0.3	0.2
AR:LITTLE ROCK	1/ 2/85	0.1	0.2
CA:BERKELEY	1/14/85	0.1	0.2
CA:LOS ANGELES	1/ 2/85	0.1	0.2
CO:DENVER	2/19/85	0.2	0.2
CO:PLATTEVILLE	2/18/85	0.2	0.2
CT:HARTFORD	1/ 2/85	0.1	0.2
DE:DOVER	1/ 2/85	0.2	0.2
FL:MIAMI	1/ 2/85	0.1	0.2
FL:TAMPA	1/14/85	0.1	0.2
GA:SAVANNAH	1/15/85	4.6	0.3
HI:HONOLULU	1/17/85	0.1	0.2
IA:CEDAR RAPIDS	2/14/85	0.2	0.2
ID:IDAHO FALLS	1/14/85	0.2	0.2
IL:MORRIS	1/ 2/85	0.1	0.2
IL:W. CHICAGO	1/ 2/85	0.1	0.2
KS:TOPEKA	1/ 2/85	0.1	0.2
LA:NEW ORLEANS	1/16/85	0.1	0.2
MA:LAWRENCE	1/ 8/85	0.1	0.2
MD:BALTIMORE	1/ 3/85	0.2	0.2
MD:CONOWINGO	1/ 2/85	0.2	0.2
ME:AUGUSTA	1/ 3/85	0.1	0.2
MI:DETROIT	1/ 4/85	0.3	0.2
MI:GRAND RAPIDS	1/ 9/85	0.1	0.2
MN:MINNEAPOLIS	1/22/85	0.2	0.2
MN:RED WING	1/21/85	0.1	0.2
MS:JACKSON	1/ 7/85	0.1	0.2
MS:PORT GIBSON	1/ 8/85	0.1	0.2
NC:CHARLOTTE	1/ 7/85	0.5	0.2
NC:WILMINGTON	1/18/85	0.2	0.2
ND:BISMARCK	1/ 2/85	0.1	0.2
NE:LINCOLN	1/14/85	0.2	0.2
NH:CONCORD	1/ 2/85	0.2	0.2
NJ:TRENTON	1/16/85	0.2	0.2

TABLE 11 (CONTINUED)

DRINKING WATER
TRITIUM CONCENTRATION

JANUARY - MARCH 1985

LOCATION	DATE COLLECTED	nCi/l	± 2s
NJ:WARETOWN	2/ 5/85	0.2	0.2
NM:SANTA FE	1/15/85	0.2	0.2
NV:LAS VEGAS	1/ 7/85	0.2	0.2
NY:ALBANY	1/14/85	0.2	0.2
NY:NEW YORK CITY	1/ 3/85	0.2	0.2
NY:NIAGARA FALLS	1/ 3/85	0.2	0.2
NY:SYRACUSE	1/31/85	0.2	0.2
OH:CINCINNATI	1/ 2/85	0.3	0.2
OH:COLUMBUS	1/ 2/85	0.1	0.2
OH:EAST LIVERPOOL	1/24/85	0.2	0.2
OH:PAINESVILLE	1/ 2/85	0.4	0.2
OH:TOLEDO	1/ 2/85	0.3	0.2
OK:OKLAHOMA CITY	1/ 3/85	0.2	0.2
OR:PORTLAND	1/ 4/85	0.1	0.2
PA:COLUMBIA	1/ 3/85	0.2	0.2
PA:HARRISBURG	1/ 3/85	0.2	0.2
PA:PITTSBURGH	1/24/85	0.2	0.2
PC:ANCON	1/ 7/85	0.2	0.2
RI:PROVIDENCE	1/14/85	0.1	0.2
SC:BARNWELL	1/ 3/85	0.1	0.2
SC:COLUMBIA	1/ 4/85	0.3	0.2
SC:HARTSVILLE	1/ 2/85	0.2	0.2
SC:JENKINSVILLE	1/11/85	0.2	0.2
SC:SENECA	1/24/85	0.2	0.2
TN:CHATTANOOGA	1/ 2/85	0.4	0.2
TN:KNOXVILLE	1/ 2/85	0.2	0.2
TX:AUSTIN	1/ 7/85	0.1	0.2
VA:DOSWELL	2/21/85	0.1	0.2
VA:LYNCHBURG	1/ 3/85	0.1	0.2
VA:VIRGINIA BEACH	1/ 7/85	0.2	0.2
WA:RICHLAND	1/ 8/85	0.3	0.2
WA:SEATTLE	1/ 4/85	0.2	0.2
WI:GENOA CITY	1/14/85	0.1	0.2
WI:MADISON	1/ 4/85	0.1	0.2

s SIGMA COUNTING ERROR

SECTION III. External Gamma Ambient Monitoring Program

The external gamma monitoring program, which began in October 1978, provides a continuous measurement of ambient gamma exposure rates, including cosmic, at selected sites throughout the continental United States. Data from this program are used to evaluate fluctuations in natural background due to variations in environmental conditions and to provide a means of monitoring any significant increases in ambient gamma levels. The program consists of approximately 22 sites representing a wide geographic coverage throughout the country.* Although exposure measurements at these few sites are not totally representative of nationwide exposures, they will be indicative of national trends.

The monitoring program utilizes CaF_2:Mn thermoluminescent dosimeters(TLD's). These dosimeters are commercially available glass-bulb type dosimeters with energy compensating shields. A group of three TLD's is located at each station or site. Dosimeters are annealed by the station operator prior to positioning in the field. The dosimeters are returned to EERF for readout approximately every three months. Several dosimeters are annealed by the station operator as controls and returned with the exposed field dosimeters to correct for any exposures accumulated during shipment.

Results from the period January - March 1985 are shown in Table 12.

* Some of these sites may not return dosimeters each period and consequently the number of sites listed may vary slightly.

TABLE 12

ENVIRONMENTAL GAMMA AMBIENT MONITORING PROGRAM

LOCATION	DATE RANGE	INTEGRATED EXPOSURE	EXPOSURE RATE	
		MR	MICRO R/HR ± 2 s *	
AL:MONTGOMERY	10785- 40485	18.2	8.7	5.7
CA:BERKELEY	10385- 40485	15.5	7.1	3.2
CO:DENVER	10885- 40285	33.7	16.7	5.7
FL:ORLANDO	10285- 40285	14.8	6.9	5.1
ID:BOISE	11085- 41585	29.6	13.0	8.1
IL:CHICAGO	10285- 40285	18.3	8.5	3.5
ND:BISMARCK	10285- 40385	22.7	10.4	5.7
NJ:TRENTON	10385- 40385	25.5	11.8	5.1
NM:SANTA FE	10485- 40285	30.1	14.3	9.0
NV:LAS VEGAS	10385- 41185	20.6	8.8	4.6
OH:COLUMBUS	10285- 40185	19.2	9.0	4.2
OK:OKLAHOMA CITY	11585- 41685	19.6	9.0	3.1
OR:PORTLAND	11685- 40385	15.9	8.6	10.2
PA:HARRISBURG	10385- 40185	16.9	8.0	9.5
PA:PITTSBURGH	30585- 40185	8.1	12.5	5.6
RI:PROVIDENCE	10985- 40985	26.0	12.0	3.8
SC:BARNWELL	10385- 41285	20.6	8.8	4.6
SC:COLUMBIA	10285- 40285	20.6	9.5	5.5
TN:KNOXVILLE	10485- 40185	22.2	10.6	3.4
VA:RICHMOND	10185- 40185	19.9	9.2	7.9
VT:MONTPELIER	11085- 40585	16.1	7.9	4.4

* s = SIGMA ERROR (IN PERCENT)

SECTION IV. Milk Program

Pasteurized Milk

This is a cooperative program with the Dairy and Lipid Products Branch, Milk Sanitation Section, Food and Drug Administration. Milk is a reliable indicator of the general population's intake of radionuclides since it is consumed fresh by a large segment of the population and contains several of the biologically important contaminants resulting from environmental releases from nuclear activities. A primary function of this program is to obtain reliable monitoring data relative to current radionuclide concentrations and determine any long-term trends.

Monthly samples are collected at 65 sampling sites with one or more located in each state and Puerto Rico. The samples are composited, according to production, from the major milk suppliers representing more than 80 percent of the milk consumed in a given population center.

The samples are analyzed for iodine-131, barium-140, cesium-137, and potassium. All 65 samples are analyzed annually in July for strontium-89, and strontium-90. Also, for the first month of the three quarters beginning January, April and October, 10 regional composite samples of milk made up from the states within each of EPA's 10 regions are analyzed for strontium-89 and strontium-90.

Iodine-131, barium-140, cesium-137 and potassium are determined by gamma spectral analysis. Strontium-89 and strontium-90 are determined by beta counting a total strontium precipitate which has been chemically separated by ion-exchange.

The values from the pasteurized milk samples for January - March 1985 are shown in Tables 13 - 15.

Strontium values from regional composite samples collected January - March are shown in Table 16.

TABLE 13

CONCENTRATIONS OF RADIONUCLIDES IN PASTEURIZED MILK

JANUARY 1985

LOCATION	DATE COLLECTED	K g/l±2s		^{137}Cs pCi/l±2s		^{140}Ba pCi/l±2s		^{131}I pCi/l±2s	
AK:PALMER	1/ 2/85	1.69	0.13	4	7	3	9	0	7
AL:MONTGOMERY	1/ 4/85	1.57	0.09	4	5	-1	6	4	5
AR:LITTLE ROCK	1/ 8/85	1.61	0.13	4	7	-4	9	-3	7
AZ:PHOENIX	1/10/85	1.59	0.13	-2	7	3	9	5	7
CA:LOS ANGELES	1/17/85	1.61	0.13	0	7	-1	9	1	7
CA:SACRAMENTO	1/ 2/85	1.48	0.08	1	5	-3	6	0	5
CA:SAN FRANCISCO	1/ 7/85	1.65	0.13	2	7	-3	9	1	7
CO:DENVER	1/31/85	3.83	0.29	18	19	-1	19	2	14
CT:HARTFORD	1/ 7/85	1.57	0.13	0	7	-2	9	5	7
FL:TAMPA	1/ 8/85	1.56	0.13	9	7	-2	9	6	7
GA:ATLANTA	1/ 4/85	1.47	0.12	1	7	-4	9	2	7
HI:HONOLULU	1/ 3/85	1.61	0.13	8	7	-3	9	3	7
IA:DES MOINES	1/ 7/85	1.62	0.09	2	5	-5	6	-1	5
IL:CHICAGO	1/ 7/85	1.52	0.12	3	7	-19	12	7	7
IN:INDIANAPOLIS	1/ 7/85	1.52	0.13	2	7	-1	9	5	7
KS:WICHITA	1/ 7/85	1.58	0.13	1	7	-4	9	-1	7
KY:LOUISVILLE	1/ 8/85	1.51	0.13	2	7	3	9	-1	7
LA:NEW ORLEANS	1/18/85	1.51	0.12	3	7	-2	9	4	7
LA:NEW ORLEANS	1/ 8/85	1.52	0.13	3	7	3	9	-3	7
MA:BOSTON	1/ 9/85	1.62	0.13	1	7	1	9	0	7
MD:BALTIMORE	1/ 4/85	1.63	0.13	-1	7	1	9	5	7
ME:PORTLAND	1/ 8/85	1.49	0.12	4	7	0	9	-2	7
MI:DETROIT	1/11/85	1.71	0.13	4	7	-2	9	4	7
MI:GRAND RAPIDS	1/ 7/85	1.61	0.13	5	7	-2	9	4	7
MN:MINNEAPOLIS	1/ 7/85	1.61	0.09	0	5	0	6	-2	5
MN:ST. PAUL	1/ 2/85	1.59	0.13	7	7	4	9	7	7
MO:KANSAS CITY	1/11/85	1.61	0.13	5	7	2	9	-1	7
MO:ST. LOUIS	1/ 2/85	1.60	0.13	4	7	-5	9	1	7
MS:JACKSON	1/ 7/85	1.52	0.13	3	7	2	9	0	7
MT:HELENA	1/ 7/85	1.47	0.12	2	7	0	9	6	7
NC:CHARLOTTE	1/ 8/85	1.73	0.24	9	18	7	19	0	14
ND:MINOT	1/21/85	1.56	0.13	-2	7	-3	9	3	7
NE:OMAHA	1/11/85	1.49	0.12	3	7	1	9	2	7
NH:MANCHESTER	1/ 7/85	1.67	0.09	6	5	0	6	2	5
NJ:TRENTON	1/ 9/85	1.60	0.09	-1	5	-2	6	2	5
NM:ALBUQUERQUE	1/ 7/85	1.52	0.09	1	5	-2	6	2	5
NV:LAS VEGAS	1/14/85	1.52	0.13	1	7	5	9	3	7
NY:BUFFALO	1/15/85	1.64	0.13	3	7	-3	9	6	7
NY:NEW YORK CITY	1/ 7/85	1.59	0.13	3	7	-2	9	6	7

TABLE 13 (CONTINUED)

CONCENTRATIONS OF RADIONUCLIDES IN PASTEURIZED MILK

JANUARY 1985

LOCATION	DATE COLLECTED	K g/l±2s	^{137}Cs pCi/l±2s		^{140}Ba pCi/l±2s		^{131}I pCi/l±2s	
NY:SYRACUSE	1/ 7/85	1.45 0.12	0	7	6	9	4	7
OH:CINCINNATI	1/ 8/85	1.43 0.12	3	7	5	9	3	7
OH:CLEVELAND	1/ 7/85	1.57 0.13	-1	7	-2	9	-1	7
OK:OKLAHOMA CITY	1/ 8/85	1.43 0.12	1	7	1	9	-2	7
OR:PORTLAND	1/ 7/85	1.61 0.09	2	5	-4	6	2	5
PA:PHILADELPHIA	1/ 7/85	1.61 0.13	0	7	-1	9	8	7
PA:PITTSBURGH	1/ 9/85	1.58 0.09	4	5	0	6	2	5
PC:CRISTOBAL	1/24/85	1.56 0.13	13	7	-1	9	-3	7
PR:SAN JUAN	1/18/85	1.59 0.13	0	7	-1	9	0	7
SC:CHARLESTON	1/29/85	1.70 0.13	2	7	5	9	-3	7
SD:RAPID CITY	1/ 7/85	1.58 0.09	-1	5	4	6	0	5
TN:CHATTANOOGA	1/ 7/85	1.59 0.13	3	7	-3	9	-1	7
TN:KNOXVILLE	1/ 7/85	1.53 0.13	1	7	0	9	-2	7
TX:AUSTIN	1/ 9/85	1.54 0.13	1	7	0	9	7	7
UT:SALT LAKE CITY	1/ 7/85	1.61 0.13	7	7	-1	9	5	7
VA:NORFOLK	1/18/85	1.51 0.12	6	7	0	9	4	7
VT:BURLINGTON	1/ 8/85	1.67 0.24	10	18	-2	18	1	14
WA:SEATTLE	1/ 2/85	1.38 0.12	3	7	2	9	2	7
WA:SEATTLE	1/31/85	3.51 0.28	7	18	6	19	-2	14
WA:SPOKANE	1/ 9/85	1.59 0.13	1	7	-1	9	4	7
WI:MILWAUKEE	1/ 7/85	1.65 0.13	0	7	-1	9	0	7
WI:MILWAUKEE	1/30/85	1.64 0.13	3	7	0	9	6	7
WV:CHARLESTON	1/30/85	1.75 0.24	-4	18	3	19	5	14
WY:LARAMIE	1/ 8/85	1.68 0.13	3	7	-7	9	1	7

s SIGMA COUNTING ERROR

TABLE 14

CONCENTRATIONS OF RADIONUCLIDES IN PASTEURIZED MILK

FEBRUARY 1985

LOCATION	DATE COLLECTED	K g/l±2s	^{137}Cs pCi/l±2s		^{140}Ba pCi/l±2s		^{131}I pCi/l±2s	
AK:PALMER	2/19/85	1.59 0.09	5	5	0	6	1	5
AL:MONTGOMERY	2/ 8/85	1.61 0.13	-1	7	1	9	6	7
AR:LITTLE ROCK	2/11/85	1.47 0.12	3	7	4	9	0	7
AZ:PHOENIX	2/ 7/85	1.54 0.13	1	7	3	9	0	7
CA:LOS ANGELES	2/11/85	1.58 0.13	2	7	-6	9	10	7
CA:SACRAMENTO	2/ 1/85	1.58 0.13	5	7	5	9	9	7
CA:SAN FRANCISCO	2/ 8/85	1.63 0.09	6	5	5	6	2	5
CO:DENVER	2/27/85	1.43 0.12	1	7	-1	9	1	7
FL:TAMPA	2/13/85	1.58 0.09	11	5	-4	6	4	5
GA:ATLANTA	2/ 3/85	1.65 0.13	5	7	-6	9	1	7
GA:ATLANTA	2/27/85	1.55 0.13	6	7	-2	9	7	7
HI:HONOLULU	2/ 2/85	1.65 0.13	3	7	-5	9	4	7
IA:DES MOINES	2/ 4/85	1.52 0.13	1	7	-1	9	3	7
IL:CHICAGO	2/ 4/85	1.54 0.13	0	7	-2	9	6	7
IN:INDIANAPOLIS	2/ 4/85	1.47 0.12	6	7	5	9	6	7
KS:WICHITA	2/11/85	1.59 0.09	4	5	-2	6	-2	5
KY:LOUISVILLE	2/ 5/85	1.55 0.13	0	7	0	9	5	7
MA:BOSTON	2/ 5/85	1.52 0.09	2	5	0	6	2	5
MD:BALTIMORE	2/ 1/85	1.50 0.09	2	5	-5	6	6	5
ME:PORTLAND	2/ 7/85	1.60 0.13	6	7	-6	9	1	7
MI:DETROIT	2/ 8/85	1.60 0.13	2	7	-4	9	1	7
MI:GRAND RAPIDS	2/ 4/85	1.57 0.13	3	7	4	9	5	7
MN:MINNEAPOLIS	2/ 4/85	1.64 0.13	3	7	-2	9	1	7
MN:ST. PAUL	2/ 5/85	1.51 0.12	2	7	-4	9	-1	7
MO:KANSAS CITY	2/ 8/85	1.52 0.13	0	7	0	9	2	7
MO:ST. LOUIS	2/ 6/85	1.53 0.13	1	7	0	9	-2	7
MS:JACKSON	2/ 5/85	1.59 0.13	4	7	4	9	4	7
MT:HELENA	2/ 8/85	1.45 0.12	2	7	0	9	5	7
NC:CHARLOTTE	2/ 4/85	1.66 0.24	8	18	-5	18	13	14
ND:MINOT	2/27/85	1.52 0.13	6	7	0	9	3	7
NE:OMAHA	2/ 8/85	1.46 0.12	2	7	1	9	8	7
NH:MANCHESTER	2/ 4/85	1.53 0.13	3	7	2	9	4	7
NJ:TRENTON	2/ 6/85	1.50 0.12	1	7	3	9	4	7
NM:ALBUQUERQUE	2/ 4/85	1.35 0.12	3	7	-6	9	10	7
NV:LAS VEGAS	2/ 4/85	1.52 0.13	-2	7	-3	9	-2	7
NY:BUFFALO	2/11/85	1.60 0.13	8	7	-1	9	4	7
NY:NEW YORK CITY	2/ 4/85	1.50 0.12	1	7	-2	9	0	7
NY:SYRACUSE	2/ 4/85	1.62 0.09	-1	5	1	6	0	5

TABLE 14 (CONTINUED)

CONCENTRATIONS OF RADIONUCLIDES IN PASTEURIZED MILK

FEBRUARY 1985

LOCATION	DATE COLLECTED	K g/l±2s	^{137}Cs pCi/l±2s	^{140}Ba pCi/l±2s	^{131}I pCi/l±2s
OH:CINCINNATI	2/ 4/85	1.52 0.09	0 5	0 6	1 5
OH:CLEVELAND	2/11/85	1.57 0.13	3 7	1 9	4 7
OK:OKLAHOMA CITY	2/ 5/85	1.66 0.13	1 7	-1 9	0 7
OR:PORTLAND	2/ 5/85	1.46 0.12	2 7	8 9	0 7
PA:PHILADELPHIA	2/ 4/85	1.55 0.13	3 7	3 9	4 7
PA:PITTSBURGH	2/ 6/85	1.79 0.25	1 18	5 19	-1 14
PC:CRISTOBAL	2/28/85	1.56 0.13	10 7	1 9	5 7
PR:SAN JUAN	2/15/85	1.48 0.12	3 7	-1 9	1 7
SD:RAPID CITY	2/ 3/85	1.61 0.13	-1 7	-2 9	3 7
TN:CHATTANOOGA	2/ 4/85	1.53 0.13	10 7	-2 9	4 7
TN:KNOXVILLE	2/ 4/85	1.55 0.13	6 7	-3 9	5 7
TN:MEMPHIS	2/27/85	1.56 0.13	1 7	2 9	-1 7
TX:AUSTIN	2/ 5/85	1.47 0.08	-1 5	4 6	0 5
UT:SALT LAKE CITY	2/ 4/85	1.51 0.09	4 5	0 6	2 5
VA:NORFOLK	2/13/85	1.53 0.13	3 7	0 9	0 7
VT:BURLINGTON	2/ 6/85	1.65 0.13	10 7	0 9	7 7
WI:MILWAUKEE	2/28/85	1.65 0.13	1 7	-4 9	3 7
WY:LARAMIE	2/ 5/85	1.63 0.13	2 7	4 9	-1 7

s SIGMA COUNTING ERROR

TABLE 15

CONCENTRATIONS OF RADIONUCLIDES IN PASTEURIZED MILK

MARCH 1985

LOCATION	DATE COLLECTED	K g/1±2s	^{137}Cs pCi/1±2s		^{140}Ba pCi/1±2s		^{131}I pCi/1±2s	
AL:ANCHORAGE	3/29/85	1.55 0.13	2	7	8	9	3	7
AL:MONTGOMERY	3/ 8/85	1.61 0.13	2	7	-9	9	3	7
AR:LITTLE ROCK	3/ 9/85	1.64 0.13	2	7	-4	9	4	7
AZ:PHOENIX	3/ 7/85	1.67 0.13	-1	7	-2	9	1	7
CA:LOS ANGELES	3/11/85	1.45 0.12	2	7	2	9	-1	7
CA:SACRAMENTO	3/ 1/85	1.56 0.13	0	7	-8	9	2	7
CA:SAN FRANCISCO	3/18/85	1.52 0.13	0	7	4	9	1	7
CO:DENVER	3/29/85	1.55 0.13	4	7	1	9	5	7
CT:HARTFORD	3/ 4/85	1.59 0.09	2	5	-4	6	-2	5
FL:TAMPA	3/12/85	1.52 0.13	5	7	-3	9	5	7
HI:HONOLULU	3/ 4/85	1.62 0.09	2	5	5	6	5	5
IA:DES MOINES	3/ 4/85	1.60 0.13	1	7	-8	9	1	7
IL:CHICAGO	3/ 4/85	1.51 0.13	5	7	1	9	1	7
IN:INDIANAPOLIS	3/ 4/85	1.49 0.12	2	7	5	9	0	7
KS:WICHITA	3/11/85	1.56 0.13	6	7	-3	9	0	7
KY:LOUISVILLE	3/ 5/85	1.54 0.09	0	5	-5	6	2	5
LA:NEW ORLEANS	3/ 5/85	1.54 0.13	4	7	-1	9	-3	7
MA:BOSTON	3/ 5/85	1.67 0.13	2	7	-3	9	2	7
MD:BALTIMORE	3/ 1/85	1.51 0.13	-4	7	2	9	6	7
ME:PORTLAND	3/ 6/85	1.67 0.13	2	7	0	9	2	7
MI:DETROIT	3/ 7/85	1.62 0.13	7	7	-6	9	-1	7
MI:GRAND RAPIDS	3/ 4/85	1.50 0.09	2	5	2	6	5	5
MN:MINNEAPOLIS	3/11/85	1.66 0.13	0	7	6	9	-3	7
MN:ST. PAUL	3/ 6/85	1.77 0.25	7	18	5	19	6	14
MO:KANSAS CITY	3/ 8/85	1.55 0.13	2	7	-4	9	4	7
MO:ST. LOUIS	3/ 6/85	1.45 0.12	1	7	-3	9	2	7
MS:JACKSON	3/ 5/85	1.60 0.13	2	7	-1	9	1	7
MT:HELENA	3/11/85	1.52 0.13	1	7	-2	9	6	7
NC:CHARLOTTE	3/11/85	1.78 0.25	4	18	5	19	-3	14
ND:MINOT	3/27/85	1.53 0.13	4	7	0	9	0	7
NE:OMAHA	3/ 8/85	1.49 0.09	4	5	0	6	2	5
NH:MANCHESTER	3/ 4/85	1.66 0.13	7	7	-1	9	-2	7
NJ:TRENTON	3/ 6/85	1.62 0.13	-3	7	1	9	6	7
NM:ALBUQUERQUE	3/ 5/85	1.65 0.13	-2	7	3	9	-3	7
NV:LAS VEGAS	3/11/85	1.63 0.13	-1	7	4	9	-4	7
NY:BUFFALO	3/11/85	1.64 0.13	0	7	0	9	-3	7
NY:NEW YORK CITY	3/ 4/85	1.67 0.09	1	5	0	6	1	5
NY:SYRACUSE	3/ 4/85	1.52 0.13	0	7	-4	9	5	7

TABLE 15 (CONTINUED)

CONCENTRATIONS OF RADIONUCLIDES IN PASTEURIZED MILK

MARCH 1985

LOCATION	DATE COLLECTED	K g/1±2s	^{137}Cs pCi/1±2s	^{140}Ba pCi/1±2s	^{131}I pCi/1±2s
OH:CINCINNATI	3/ 4/85	1.50 0.12	3 7	-5 9	0 7
OH:CLEVELAND	3/11/85	1.64 0.13	-2 7	-3 9	2 7
OK:OKLAHOMA CITY	3/ 4/85	1.56 0.09	0 5	-2 6	2 5
OR:PORTLAND	3/11/85	1.52 0.13	1 7	-2 9	2 7
PA:PHILADELPHIA	3/ 4/85	1.56 0.13	0 7	-7 9	2 7
PA:PITTSBURGH	3/ 5/85	1.62 0.24	-5 18	2 19	5 14
PC:CRISTOBAL	3/25/85	1.46 0.12	10 7	-4 9	4 7
SC:CHARLESTON	3/14/85	1.55 0.13	4 7	0 9	-2 7
SD:RAPID CITY	3/ 6/85	1.52 0.13	0 7	-1 9	-3 7
TN:CHATTANOOGA	3/ 4/85	1.59 0.13	-3 7	0 9	0 7
TN:MEMPHIS	3/26/85	1.51 0.12	2 7	1 9	3 7
TX:AUSTIN	3/ 5/85	1.52 0.13	-1 7	-3 9	4 7
UT:SALT LAKE CITY	3/ 3/85	1.58 0.13	-2 7	-4 9	1 7
VA:NORFOLK	3/14/85	1.63 0.13	-2 7	0 9	3 7
VT:BURLINGTON	3/11/85	1.60 0.13	1 7	2 9	2 7
WA:SEATTLE	3/28/85	1.53 0.13	2 7	7 9	2 7
WA:SEATTLE	3/ 1/85	1.58 0.13	-2 7	0 9	1 7
WA:SPOKANE	3/ 5/85	1.59 0.09	3 5	-1 6	4 5
WV:CHARLESTON	3/12/85	1.67 0.17	12 13	-3 13	5 10
WY:LARAMIE	3/ 6/85	1.62 0.09	3 5	-1 6	4 5

s SIGMA COUNTING ERROR

TABLE 16

STRONTIUM-90 AND STRONTIUM-89 IN PASTEURIZED MILK

EPA REGIONAL COMPOSITES

JANUARY - MARCH 1985

EPA REGION	^{90}Sr pCi/l ± 2s		^{89}Sr pCi/l ± 2s*	
I	2.7	0.3	-2	1
II	2.0	1.0	1	4
III	2.8	0.8	-2	2
IV	2.8	0.5	-2	2
V	2.5	0.4	-1	1
VI	2.8	0.5	0	1
VII	1.4	0.3	2	1
VIII	1.8	1.1	1	4
IX	0.4	0.4	2	1
X	2.0	0.7	-2	3

s SIGMA COUNTING ERROR
s* ANALYTICAL ERROR TERM WHICH CLOSELY APPROXIMATES THE COUNTING ERROR

Carbon-14 in Milk

Nine stations, chosen for wide geographical distribution, contribute milk samples for annual analysis for carbon-14. These samples have monitored the carbon-14 levels in the food chain resulting from nuclear testing.

Analysis consists of combusting the samples and measuring released carbon dioxide through liquid scintillation.

Data will be published as it becomes available.

ENVIRONMENTAL RADIATION DATA (ERD) is published quarterly (January, April, July, October) by the U. S. Environmental Protection Agency's Office of Radiation Programs.

Requests for information concerning publication and distribution of ERD should be directed to:

Charles M. Petko
Technical Support Branch
Eastern Environmental Radiation Facility
1890 Federal Drive
Montgomery, Alabama 36109

Requests for information concerning the operation of ERAMS should be directed to:

Charles R. Phillips, Chief
Monitoring and Analytical Services Branch
Eastern Environmental Radiation Facility
1890 Federal Drive
Montgomery, Alabama 36109

or to:

James W. Gunter, Chief
Environmental Studies and Statistics
Analysis and Support Division (ANR-461)
U. S. Environmental Protection Agency
Waterside Mall East
401 M Street, SW
Washington, DC 20460

***